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# Being in the world

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**Abstract.** This essay addresses a question raised by Helmut Pape: "What logical, semiotical and mental structure does our consciousness have to have in order to establish the proper link between perception, thought and propositional content expressed by indicators?" The answer, it is proposed, is found in Peirce's Existential Graphs (EG). First, EG is, itself, a model of cognition that provides the formal structure required for such a consciousness. Second, an appropriate semiotical interpretation will give us the requested structure. Third, interpreted as a psychological or perceptual model, EG will represent the links we seek.

**Keywords**: consciousness, existential graphs, indexicality, Charles Peirce, reactional sign

In the note on indexicality and consciousness that Helmut Pape circulated to the participants of the Hannover symposium on Consciousness and Indexicality,[1] he posed the question: "What logical, semiotical and mental structure does our consciousness have to have in order to establish the proper link between perception, thought and propositional content expressed by indicators?" From a Peircean point of view, which is the point of view I shall assume, there is little to be gained by asking for a logical as well as a semiotical analysis of consciousness. That is because, according to Peirce, logic *is* semiotic. But I suppose that the "logic" Pape has in mind is the more formal and abstract theory of relations that in Peirce's system ought to be assigned to mathematics. When Pape asks about the mental structure of consciousness, in addition to the semiotical structure, I suppose he has perceptual structures, or psychology, in mind. So I take it that Pape is asking about the formal, semiotical, and psychological

[1] This paper was originally presented to the Symposium on Consciousness and Indexicality held at Hannover University on 4–7 October 1995. The symposium was organized by Helmut Pape (Hannover) and Matthias Ketner (Frankfurt).

structures of consciousness that undergird or constitute our capacity for indexical reference.

As we consider Pape's question further, more complexity emerges. The focus of the interrogation is on the structural conditions required for the *proper link* between perception, thought and propositional content expressed by indicators. It is not clear precisely what linkage is under scrutiny. Presumably by "propositional content expressed by indicators" Pape has in mind *objects* of indexical reference, but it is doubtful that, for Peirce, such objects should be regarded as the contents of propositions unless the objects are themselves propositional (or semiotical). To say of indices that they *express* propositional content, if what is meant by propositional content is external objects of reference, seems to involve either a non-Peircean conception of indices or a non-Peircean conception of content. It seems to me that the pure Peircean index does not express any content at all – *that*, in fact, may be the key to unravelling the mystery of its function.

Of course it is true that indices themselves are usually parts of, or contents of, propositions, and certainly any successful operating intelligence requires the proper *interlinking* of indexically loaded contents – both between perceptions and thought and between different thoughts. How in consciousness we manage to keep these links straight is a different question from how we consciously link with external objects. The first concerns the interlinkages between intellectual or mental entities (index to index) while the second concerns the more basic links between the intellect and the world external to it.

It is likely that Pape intended his question to be general enough to encompass all of these issues, which must be intricately interwoven in any satisfying philosophy of language (or cognitive science). What seems called for is a model that represents the architecture or the functional-relational structure that has to be postulated of consciousness to account for the crucial role played by indices in linking perception with thought and with non-linguistic or non-semiotic objects of thought. One way to answer Pape's question is indexically; I could *point to* such a model, if indeed a good model of this sort has already been developed, and, to some extent, that is what I will do. But hopefully what I have to say will be more informative than a mere index could be of the structural model I will offer.

Before turning to structural considerations, I want to review some of the things Peirce said about indexicality. When I think of a Peircean index, I think of the link between thought or language and the non-linguistic so-called external world: where we find the objects (or from a different point of view, the subjects) of our thought. Consider the following little story from a manuscript Peirce wrote in 1893 (from MS 595, entitled "The Short Logic"):

> Suppose two men meet upon a country road and one of them says to the other, "The chimney of that house is on fire". The other looks about him and descries a house with green blinds and a verandah having a smoking chimney. He walks on a few miles and meets a second traveler. Like a Simple Simon he says, "The chimney of that house is on fire". "What house?" asks the other. "Oh, a house with green blinds and a verandah," replies the simpleton. "Where is the house?" asks the stranger. He desires some *index* which shall connect his apprehension with the house meant. Words alone cannot do this. The demonstrative pronouns, "this" and "that", are indices. For they call upon a hearer to use his powers of observation, and so establish a real connection between his mind and the object; and if the demonstrative pronoun does that – without which its meaning is not understood – it goes to establish such a connection; and so is an index. (CP 2.287)

The key lesson of this little tale seems to be that we cannot make the link Pape has in mind by intellectual means alone. Words will not do the trick, not unless those words transcend their intellectual value to put us in direct contact (or at any rate, in a real relation) with the referent object or circumstance. If we cannot make the link between thoughts and external objects then we really can't have a robust semantics at all – this seems implicit in Peirce's story. We do not have to know *what house* is at issue to see that the simpleton's sentence is well-formed and to understand the general idea of it; but unless a *real connection* is established between the sentence and some particular house it will be a failed sentence with no reference. This is enough to call into question some popular research strategies in psychology and cognitive science that are based on the idea that we can learn everything there is to know about intelligence by studying individual minds and nervous systems without attending at all to interactions with external objects.

I do not mean to suggest that Peirce stood alone in this view or that it was decidedly new. Peirce came fully to this view in the mid-1880s when he began to emphasize that "the actual world cannot be distinguished from a world of imagination by any description", but, as he pointed out, it is a position essentially present in Kant's *Critique* (or *Critik,* as Peirce preferred). This doctrine that "the actual world cannot be distinguished from a world of imagination by any description", has far-reaching consequences for language and logic, and Peirce was clever and persistent in following out these consequences. One important consequence that Peirce discovered was the need for pronouns and indices.

The picture that begins to emerge is of sentences or propositions that contain pointing words, words that properly fulfill some grammatical function in a complete sentence but which somehow transcend that role to *actually put the hearer in touch with* external objects. Certainly this fits the function of demonstrative words like 'that' and 'there'. But even demonstratives can *successfully* point only when they are used in appropriate contexts with hearers who are properly oriented. To say that such

words transcend their grammatical or linguistic function means that they are not mere symbols, having only conventional links with their objects of reference: they are also, and for us, more importantly, indices.

It might be helpful at this point to review Peirce's classification of signs with respect to their relation types to referent objects. For this review I will quote part of a paragraph from the Harvard edition of Peirce's writings (in this passage Peirce uses the word 'representamen' to designate 'sign' in the broadest possible sense):

> An *icon* is a representamen which fulfills the function of a representamen by virtue of a character which it possesses in itself, and would possess just the same though its object did not exist. Thus, the statue of a centaur is not, it is true, a representamen if there be no such thing as a centaur. Still, if it represents a centaur, it is by virtue of its shape; and this shape it will have, just as much, whether there be a centaur or not. An *index* is a representamen which fulfills the function of a representamen by virtue of a character which it could not have if its object did not exist, but which it will continue to have just the same whether it be interpreted as a representamen or not. For instance, an old-fashioned hygrometer is an *index*. For it is so contrived as to have a physical reaction with dryness and moisture in the air, so that the little man will come out if it is wet, and this would happen just the same if the use of the instrument should be entirely forgotten, so that it ceased actually to convey any information. A *symbol* is a representamen which fulfills its function regardless of any similarity or analogy with its object and equally regardless of any *factual* connection therewith, but solely and simply because it will be interpreted to be a representamen. Such for example is any general word, sentence, or book. (CP 5.73)

I have included Peirce's characterization of icons and symbols because I will continue to refer to them, but it is mainly the index that concerns us. The index, Peirce says, would not have its character if its object *did not exist*. Why? Because it is fundamentally a reactional sign, dependent *as a sign* on some *real* or *factual* connection with its object. Why is a weather vane an index and not an icon. Because the plane of the weather vane is not independent of the direction of the wind, as it would be were it an icon. It is of the essence of a weather vane that it lie in the plane of the direction of the wind as a direct result of the wind itself. As a reactional sign, it may seem that an index involves only a causal relationship of a mechanical or efficient variety, but Peirce denies this. While mechanical (or dyadic) causality is crucial to the indexical function, the semiotic action that is performed in indexical semiosis is mental, just as it is with any sign. That means that if you put your hygrometer away in your attic and forget about it, it may continue to function mechanically, so that it *could* convey information and thus function as an index, but insofar as it is forgotten and out of sight and mind it ceases to be one.

Perhaps a better example is an ordinary thermometer. It is common to find thermostatic regulation put forward as a minimal case of mental action because it seems to be goal directed. Peirce agrees that goal directedness, or as he prefers, final causation, is a mark of the mental. But he denies that a thermometer *as such* is an index, or that thermostatic regulation is mental. Again quoting from the Harvard edition:

> [T]he rise of the mercury in an ordinary thermometer or the bending of the double strip of metal in a metallic thermometer is an indication, or, to use the technical term, is an *index*, of an increase of atmospheric temperature, which, nevertheless, acts upon it in a purely brute and dyadic way. In these cases, however, a mental representation of the index is produced which mental representation is called the *immediate object* of the sign, and this object does triadically produce the intended, or proper, effect of the sign strictly by means of another mental sign; and that this triadic character of the action is regarded as essential is shown by the fact that if the thermometer is dynamically connected with the heating and cooling apparatus, so as to check either effect, we do not, in ordinary parlance speak of there being any *semeiosy*, or action of a sign, but, on the contrary, say that there is an "automatic regulation", an idea opposed, in our minds, to that of semeiosy. For the proper significate outcome of a sign, I propose the name, the *interpretant* of a sign. (CP 5.473)

In other words, the proper significate outcome of an index is an interpretant, usually a conception or thought of some sort, but one whose intellectual value is dependent on its existential situation vis-à-vis its referent object.

We can now give a preliminary answer to one of the questions raised earlier: How is it possible for perception and thought to be properly linked to the external world? Consider again Peirce's story about the house with the burning chimney. Upon being told, "The chimney of that house is on fire", Peirce's Simple Simon looked around to find the alleged house. The "that" in the sentence indicated that the referent house was in the vicinity. Upon spying a house with a smoking chimney, the simpleton took it to be the house referred to in the sentence and judged that its chimney was on fire. The simpleton had begun with a conception or thought that a house in the vicinity had a burning chimney, looked around for a sign, perceived a smoking chimney, took it as an index of a chimney fire, and thus judged that *that* was the house he had been told about. Here we find perception and thought clearly connected to each other and with the external world, and the links that bring them all together appear to be the indexical 'that' in the sentence and the perceived smoke taken (indexically) to be a sign of fire. Whether these linkages are proper largely depends on whether the smoking chimney really is the burning chimney and this can be determined by further investigation. When the simpleton met another traveller, miles from the referent house, and repeated

the sentence he had himself been told, "The chimney of that house is on fire", the traveller, not properly situated relative to the house, could not pick it out. Neither the indexical 'that' nor the descriptive information in the sentence were sufficient to create a real relation between what Peirce called the traveller's apprehension and the house the simpleton had in mind. The additional information that the house had green blinds and a verandah could not help because of the distance separating the traveller from the house, unless the traveller had already *seen* the house and remembered these attributes as distinctive. Had that been that the case, the information that the house had green blinds and a verandah would itself have been an index for the traveller. But in the story, the traveller is left befuddled, without any way to link up the idea of a house with a burning chimney with an actual house. Still, we are left with a clear sense that all that is needed is a suitable index, such as: "Starting from this point, go south five miles to the great willow tree at the fork of the road, and look to the west. There you will see the house I have told you about". So it appears that perception and thought can be properly linked to the external world through the bridging function of indices and the ability and willingness of the perceiver/conceiver to engage in active observation of his environment.

What can be said about the structure of consciousness that is necessary in order to sustain the proper links between perceptions and thoughts or between thoughts themselves? These are the index to index links I referred to above. The wording of Pape's question suggests that propositions containing indices are key to this problematic, and I think he is right. For Peirce every proposition is made up of a logical subject and a logical predicate, not equivalent to grammatical subjects and predicates. The logical predicate is a sort of image or picture, iconic in nature, that essentially conveys the content of the proposition. Peirce usually depicts the logical predicate of a proposition as a sentence with the names (including pronouns) blanked out. For example, "[blank] of [blank] is on fire" would be the logical predicate of the sentence "The chimney of that house is on fire". The logical subjects (or objects) are the referents of the names we insert in the blanks to make a complete sentence. In his definition of 'proposition' for the *Century Dictionary,* Peirce claimed that the subjects of a proposition "cannot be sufficiently indicated by any general description, but only by a real junction with experience, as by a finger-pointing". So we can divide propositions, which as complex signs are symbols, into logical subjects and predicates of which the predicates are icons and the subjects are indices. This suggests that the points of connection between intellectual or conceptual entities are made at the place of the logical subjects of propositions.

I have now covered the main Peircean ideas about indexicality that will have to be reflected or incorporated in the structure of any consciousness sufficiently developed to meet the indexical conditions Pape laid out in his question. I believe that an interesting

architecture for such a consciousness was designed by Peirce himself in his system of logical graphs called the Existential Graphs (EG). Peirce actually designed EG to model thought in action, as he said; today this work might fall under the rubric of formal cognitive science (or logic of cognition). Since the late 1970s, John Sowa has been developing a system of conceptual graphs, based on Peirce's EG, and Sowa's system has been the subject of intensive research for several years. The group doing this research seems convinced that EG provides the best basic logic for a formal model of natural language and cognition. This conforms nicely with Peirce's intention for his graphs, and it lends support to the claim that EG is not *just* another system of formal logic with an unusual syntax.[2]

In what follows I will present EG in its bare essentials, giving just enough to provide "the general idea" and to show why I think EG promises to be a rich model of the structures Pape asked about. My description of EG as a formal system of logic comes almost entirely (and much of it word for word) from the writings of Don D. Roberts.[3]

EG is a complete and consistent treatment of the logic of propositions and the logic of quantifiers. It is distinguished from most other systems of logic by its two-dimensional syntax and by its small number of special symbols.

The primitive symbols of EG are:

(1) a two-dimensional surface on which graphs are to be placed, called the 'sheet of assertion' (SA);

(2) a self-returning finely drawn line,  , called the 'cut';

(3) a heavily drawn line,  , called the 'line of identity', or 'line' for short; and

(4) an infinite supply of spots with no hooks, an infinite supply of spots with one hook, an infinite supply of spots with two hooks, and so on.

The sheet of assertion (SA) is the surface used by the graphist; it is usually a sheet of paper, a blackboard, or a computer screen. It represents the universe of discourse – the sum total of all that is to be referred to or reasoned about. Sometimes Peirce imagined books of these sheets of assertion, each representing separate modalities or different universes of discourse. For this work, I have my book of sheets open to the universe of actuality – the universe of most common discourse. A cut is used to separate, or fence off, part of the sheet of assertion for separate treatment.

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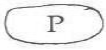
[2] See especially Sowa 1976, 1984, 1997, 2000.

[3] The fullest presentation of Peirce's Existential Graphs is given in Roberts 1973, but I have found Roberts 1967 and 1992 to be extremely useful expositions.

To understand the part of EG I am presenting, it is important to know what Peirce meant by 'spot', 'line' and 'hook', but before I take up those terms I want to explain what he meant by 'graph'. According to Roberts, the word 'graph' is used in a technical sense, to denote the EG analogue of 'legitimate sentence' or 'well-formed formula'. There are five *formation rules* that determine the class of graphs:

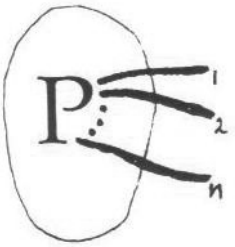
(1) Any part of the blank SA is a graph.

(2) Any unattached line of identity is a graph.

(3) If P is a graph, cut-P (  ) is a graph.

(4) If P is a spot with *n* hooks, then both

and



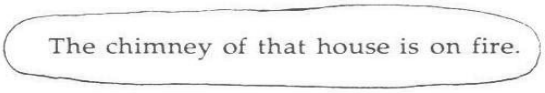
are graphs.

(5) If P and Q are graphs, then P Q (in juxtaposition) is a graph.

A graph is anything written or drawn (scribed) on the sheet of assertion if it is well-formed. Whatever is written unenclosed on SA is asserted to be true of the universe represented by SA. Roberts says we can think of what we write on SA as making the representation of the universe of discourse more determinate. So if we scribe

The chimney of that house is on fire.

on SA, we are asserting that proposition to be true. This is a graph. If we enclose this graph in a cut, thereby scribing a different graph,




we deny that the chimney of that house is on fire. Graphs are strictly read from the outside in (endoporeutically) so that this graph would be strictly read "It is false that the chimney of that house is on fire". But it is typical to give an equivalent but more user-friendly reading, such as, "The chimney of that house is not on fire".

Now I will turn to spots, lines, and hooks, and it will not take long to begin to see the relevance to the general topic of this paper. (I continue to rely heavily on Roberts' expositions of EG.)

Let an underlined extended blank space [_____] "be used to mark the place of a noun which has been erased from a proposition. A blank form of proposition produced by such erasures as can be filled, each with a proper name or noun or noun phrase, to make a proposition again, will be called a *spot,* or, relatively to the proposition of which it is conceived to be a part, the *predicate of that proposition*." These are some examples of spots:

Plato is the son of [_____]
[_____] loves [_____]
[_____] is the sum of [_____] and [_____]
[_____] is that house
[_____] has [_____]
[_____] is a chimney
[_____] is on fire

Any analysis of a proposition will show it to have only one predicate, but because the analysis of propositions can proceed in several different ways, different analyses will produce different predicates. Thus, the proposition "Drinking coffee brings pleasure to some people" may be considered as having for its predicate any of the following eight spots:

[_____] brings [_____] to [_____]
[_____] brings pleasure to [_____]
[_____] brings [_____] to some people
Drinking coffee brings [_____] to [_____]
Drinking coffee brings pleasure to [_____]
Drinking coffee brings [_____] to some people
[_____] brings pleasure to some people
Drinking coffee brings pleasure to some people

Note that the entire proposition may be considered a predicate.

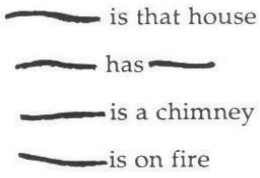
A *subject of a proposition* is any part of the proposition which might be replaced by a proper name, and still leave the proposition a proposition. This distinguishes the logical subject from what grammarians call the subject.

In EG, spots containing blanks do not count as graphs, because they do not express propositions. Obviously spots can be turned back into propositions by reinserting the

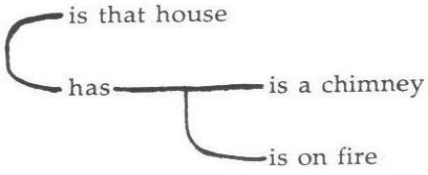
erased nouns or noun phrases, or we could replace the blanks with proper names. We can also turn the spots into propositions by replacing the blanks with lines of identity, where the lines function somewhat like indexical nouns. When the blanks are replaced with lines of identity the distinction between subjects and predicate remains perspicuous. A line of identity denotes the existence of a single, individual (but otherwise undesignated) object in the universe of discourse. A line of identity by itself on the sheet of assertion is a graph, and therefore represents a proposition. It may be read simply as "Something exists", which is true as long as there is at least one thing in the universe. Lines can come in any length or shape and can branch off to attach to any number of spots. Lines are attached to spots by hooks that the spots are assumed to have in appropriate places. So if we take the four predicates:

[blank] is that house
[blank] has [blank]
[blank] is a chimney
[blank] is on fire

and attach lines of identity in place of the blanks, we get

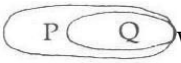



Now we have four graphs [propositions] which we may imagine to be juxtaposed on the same sheet of assertion. By the rules of the graphs, juxtaposition represents conjunction, so these four propositions become a compound graph which we can read as: "Something is that house, and something has something, and something is a chimney, and something is on fire". If we connect some of the lines to consolidate the apparent excess of individuals we will recognize the form of the sentence we have been dealing with from Peirce's story:

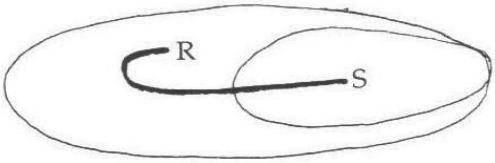


This graph may be read "Something, which is that house, has something that is a chimney and it is on fire", but a more natural reading is "The chimney of that house is on fire".

This is about all that is necessary for my purposes here, but for a somewhat more complete sense of the system I'll add one more EG form, the scroll:  . It is a cut within a cut [physically stretched out] and would be read "It is false that it is false that". Any graph on the inmost area, in other words, would be doubly negated, as long as there were no graph on the once enclosed area. For example, 

can be read "Not not P" which is equivalent to P. But 

would be read, endoporeutically, as "Not (P and not Q)" where what is being denied is the conjunction of P and not Q. This is, of course, equivalent to the conditional expression, "If P then Q". In EG, the scroll is in fact the sign of material implication. Whatever is in the once enclosed area is the antecedent and whatever is in the twice enclosed area is the consequent. When we add lines of identity to our graphs, we quantify them. The simple graph  is on fire, which is unenclosed, is existentially quantified. It tells us that "Something is on fire". If we add a line of identity to the conditional graph by connecting a spot R with a spot S,




we get a universally quantified expression: "Whatever is R is S" or "All R's are S's". The rule is that if a line has its outermost extremity on an unenclosed area (the SA) or on any evenly enclosed area, it acts as an existential quantifier, while lines whose outermost extremities lie on oddly enclosed areas act as universal quantifiers.

To this partial basis (and I have left out a great deal) Peirce added two axioms,

A1 The blank sheet of assertion

A2 The unattached line of identity

and five rules of inference (or transformation)

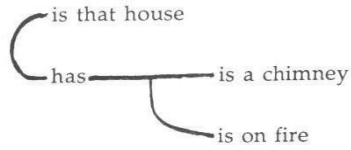
R1 The rule of erasure

R2 The rule of insertion

R3 The rule of iteration
R4 The rule of deiteration
R5 The rule of the double cut

which gives us a complete and consistent system of first order logic.[4] (Here ends my heavy reliance on the Roberts' work.)

Suppose now that we entertain briefly the idea that EG is the structural model we are looking for in answer to Pape's leading question for this symposium. How could we represent the linkage between perception, thought, and propositional content expressed by indicators? It seems to me that spots in EG, non-(or pre-)propositional logical predicates, might be taken to correspond to percepts.[5] As soon as we succeed in attaching (associating) a spot (or percept) with a line of identity (an individual) we have obtained a proposition (a perceptual judgment). Now, presumably, thought involves a concerted movement or development from proposition to proposition (or from sign to sign), in some way under the guidance of rules (or habits) of inference. EG provides an excellent representation of such a development of thought. As an exclusive feature it offers the line of identity which models the indexical links we are looking for between intellectual entities. Consider again the graph,




Recall that when the traveller asked Simple Simon what house he was referring to, Simple Simon answered: "Oh, a house with green blinds and a verandah". How could this information be added to the traveller's stock of intelligence? In EG this added descriptive sentence would be represented in a graphical proposition such as the following:

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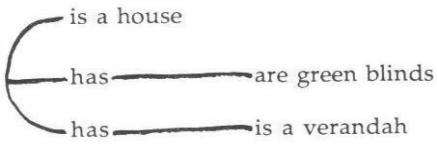
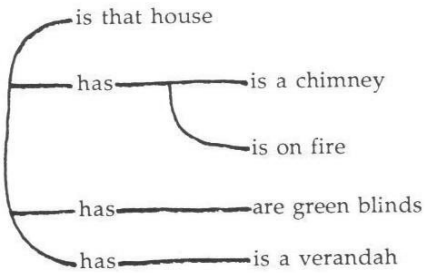
[4] See Roberts 1973 and 1992 for a thorough discussion of these axioms and rules.

[5] Peirce's account of perception, somewhat oversimplified, was that it is a process involving percepts and perceptual judgments, where percepts are felt but not thought, and where perceptual judgments are intellectual pronouncements (propositional in form) responsive to percepts (CP 7.615ff and Hookway 1985: 156ff). It is the vast accumulation of perceptual judgments, interrelated and refined by years of experience and thinking, that constitutes the contents of a mind – or as we sometimes say, one's thought.




But since it is understood that only one house is under consideration (wherever it may be) the lines of identity attached to "is a/that house" would be attached to each other and the duplicate spot could be erased. The resulting graph would look like this:




In a similar way premisses can be introduced, combined, modified, and otherwise transformed by the rules of EG, enabling us to reach conclusions that are distant from their premisses, without ever losing the indexical connectedness of the individuals we are reasoning about.[6]

It seems to me, then, that EG gives us a structured formal system, a model, for representing the links between perception, thought, and propositional content expressed by indicators. Whether the linking is proper might, on this model, merely be a question of whether or not the rules of EG have been properly applied.

But what about the links between the graphs and the world external to the graphs (corresponding to the links between intellectual systems and the external world)? Admittedly that is more problematic. Of course the lines of identity *do represent* individuals in the external world (assuming that that is the world represented by our sheet of assertion), but only after the fashion of demonstrative pronouns. But even that overstates the case, for lines of identity act as quantifiers and therefore cannot even achieve the force of a pronoun. The fact is, graphs cannot make actual contact

[6] How the graphist is able to match up lines of identity in scribing premisses in the first place is, I acknowledge, a vexed question, but it is part of the more general problem of how we can safely assert premisses (especially contingent premisses). I believe that Peirce's logic of abduction is fundamental for this initial stage of argumentation but I cannot pursue this question here. Psychologically, the problem concerns how we are able to *recognize* identity across time and space.

with the world any more easily than ordinary sentences can; they too have to resort to definite descriptions and demonstratives. You may have noticed that when I scribed the sentence "The chimney of that house is on fire", I included the indexical 'that' in the graph: I scribed "is that house" instead of "  is a house". It is by virtue of such definite indexical expressions that we can connect our graphs with the external world, but they do not make that connection for us – they call on us to rise up, to move our bodies, to use our powers of observation to find the place in the world they are pointing to. In a paper entitled "Critic of Arguments" Peirce told a variant of the story given above:

> Two men meet on a country road. One says to the other, "that house is on fire". "What house?" "Why, the house about a mile to my right." Let this speech be taken down and shown to anybody in the neighboring village, and it will appear that the language by itself does not fix the house. But the person addressed sees where the speaker is standing, recognizes his *right* hand side [...] estimates a *mile* [...] and looking there, sees a house. It is not the language alone, with its mere associations of similarity, but the language taken in connection with the auditor's own experiential associations of contiguity, which determines for him what house is meant. It is requisite then, in order to show what we are talking or writing about, to put the hearer's or reader's mind into real, active connection with the concatenation of experience or of fiction with which we are dealing, and, further, to draw his attention to, and identify, a certain number of particular points in such a concatenation. If there be a reader who cannot understand my writings, let me tell him that no straining of his mind will help him: his whole difficulty is that he has no personal experience of the world of problems of which I am talking, and he might as well close the book until such experience comes. (CP 3. 419)

Peirce's point about the necessity for experience in order to make the critical link between the world of intellect and the world outside intellect is so important I am tempted to stop here, but I want to tie up one or two loose ends. Peirce's EG gives us a general model for representing the indexical linkings in perception and thought *that can be represented iconically* (that is done with lines of identity), and the graphs can accommodate the pointing words and descriptions that we need to connect our thoughts with their appropriate objects, but how does EG help us answer Pape's leading question: What logical (or formal), semiotical, and mental (or psychological) structure does our consciousness have to have in order to establish the links we are concerned with?

The answer is that EG gives us a basic structure that applies under different interpretations in all three cases. First, EG is, itself, a model of cognition that provides the formal structure required for such a consciousness. Second, an appropriate semiotical interpretation will give us the requested semiotical structure. I cannot develop this interpretation here, but it would probably identify spots with immediate

objects, graphs with symbols, transformed graphs with interpretants, and the external objects represented by lines of identity or pointed to by the demonstrative expressions with dynamic objects. Transformations would represent semiosis. Third, interpreted as a psychological or perceptual model, EG will again, I believe, represent the links we are after. Spots will be identified with percepts, spots attached to lines with perceptual judgments, graphs in general would be identified with beliefs (or with intellectual entities expressible as propositions), and graphical transformations with thought processes.

I have finished with a mere sketch. I do not pretend to have worked out these interpretations sufficiently to have proved their legitimacy, but I think they are promising and I hope to have shown that much.

Let me conclude with a remark on my title: "Being in the World". Some readers may have expected a little Heideggerian interlude, and in fact I had picked out a quotation from Heidegger and another from Husserl to underscore Peirce's admonition that we must confront the world of existence or else close the book.[7] But I will say only this. Notice that on every interpretation of EG, or that part of it I have recommended as our model of consciousness, there is nothing that can be scribed without a line of identity. In a word, there is nothing we can scribe, nothing we can say, nothing we can think, nothing we can perceive that is not attached to a line that represents some being in the world represented by the sheet of assertion. This was a core belief for Peirce and is a key to his brand of pragmatism.[8]

## References

Heidegger, Martin 1962. *Being and Time.* (Macquarrie, John; Robinson, Edward, trans.) New York: Harper & Row.

Hookway, Christopher 1985. *Peirce.* London: Routledge & Kegan Paul.

Houser, Nathan; Roberts, Don D.; Evra, James Van (eds.) 1997. *Studies in the Logic of Charles Sanders Peirce.* Bloomington: Indiana University Press.

Husserl, Edmund 1970. *Logical Investigations.* (Findlay, John Niemeyer, trans.) New York: Routledge & Kegan Paul.

Lehmann, Frederick W. IV (ed.) 1992. *Semantic Networks in Artificial Intelligence.* New York: Pergamon Press.

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[7] In his sixth investigation (*Logical Investigations* II, p. 784) Husserl wrote: "being can arise only when *some being, actual or imaginary, is set before our eyes*," and in *Being and Time* (p. 26) Heidegger wrote: "being lies in the fact that something is, and in its Being as it is; in Reality; in presence-at-hand; in subsistence; in validity; in Dasein; in the 'there is'". I believe that what Peirce says about situatedness in the world resonates with these Germanic strains.

[8] *Acknowledgement.* I am grateful to the Harvard University Philosophy Department for permission to quote from the Peirce manuscripts housed in the Houghton Library.

Peirce, Charles Sanders 1849–1914. The Charles S. Peirce Papers. Manuscript collection in the Houghton Library, Harvard University.
– 1931–1958. *Collected Papers of Charles Sanders Peirce*. (Vols. 1–6, Hartshorne, Charles; and Weiss, Paul, eds.; vols. 7–8, Burks, Arthur W., ed.) Cambridge: Harvard University Press. [CP]
Roberts, Don D. 1967. *Logical Fragments*. Waterloo: University of Waterloo. [Limited edition.]
– 1973. *The Existential Graphs of Charles S. Peirce*. The Hague: Mouton.
– 1992. The existential graphs. *Computers & Mathematics with Applications* 23: 639–663. [Repr. in: Lehmann, Frederick W. IV (ed.) 1992, *Semantic Networks in Artificial Intelligence*. New York: Pergamon Press.]
Sowa, John F. 1976. Conceptual graphs for a data base interface. *IBM Journal of Research and Development* 20: 336–357.
– 1984. *Conceptual Structures: Information Processing in Mind and Machine*. Reading: Addison-Wesley.
– 1997. Matching logical structure to linguistic structure. In: Houser, Nathan; Roberts, Don D.; Evra, James Van (eds.), *Studies in the Logic of Charles Sanders Peirce*. Bloomington: Indiana University Press, 418–444.
– 2000. *Knowledge Representation: Logical, Philosophical, and Computational Foundations*. Pacific Grove: Brooks Cole.

## Бытие в мире

Статья посвящена вопросу, поднятому Гельмутом Папе: “Какой должна быть логическая, семиотическая и ментальная структура нашего сознания, чтобы установить надлежащую связь между восприятием, мыслью и содержанием пропозиции, выраженными индикаторами?” Возможный ответ находится в экзистенциальных графах (EG) Пирса. Во-первых, EG сами по себе являются моделью когниции, которая обеспечивает формальную структуру, требуемую для сознания. Во-вторых, соответствующая семиотическая интерпретация дает нам требуемую структуру. В-третьих, интерпретируемая как психологическая или перцепционная модель, EG сама предоставляет связи, которые мы ищем.

## Maailmas olemine

Artikkel puudutab küsimust, mille tõstatas Helmut Pape: “Milline peab olema meie teadvuse loogiline, semiootiline ja mentaalne struktuur selleks, et kehtestada tõelist seost taju, mõtte ja indikaatorite väljendatava propositsioonilise sisu vahel?” Pakutakse välja, et vastuse võib leida Peirce’i eksistentsiaalsetest graafidest. Esiteks on eksistentsiaalne graaf (EG) ise kognitsioonimudel, mis pakub teadvuse kui sellise jaoks vajalikku formaalset struktuuri. Teiseks annab meile nõutava struktuuri kohane semiootiline tõlgendus. Kolmandaks, tõlgendatuna psühholoogilise või pertseptuaalse mudelina esindab EG ise neid seoseid, mida me otsime.